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UNIVERSITY OF TORONTO

REPORT OF THE DEAN OF THE FACULTY OF MEDICINE

SESSION 1933-1934

THE UNIVERSITY OF TORONTO PRESS

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FACULTY OF MEDICINE

Toronto, June 30th, 1934.

To the Graduates in Medicine of the University of Toronto:

The Annual Report of the Dean of the Faculty of Medicine for the Session 1933-34 is sent to you with the cordial greetings and good wishes of the Faculty of Medicine.

*J. G. FitzGerald, M.D.,
Dean.*

REPORT OF THE DEAN OF THE FACULTY OF MEDICINE

(J. G. FITZGERALD, M.D., LL.D.)

The session 1933-1934 in the Faculty of Medicine has again been characterized by excellent team-work by members of all departments. There has been a thorough-going and determined effort to maintain the highest standards of productive scholarship and at the same time to provide suitable instruction in the medical sciences for the large body of undergraduates, this year numbering 798.

There was a reduction in the number of students registered in the first year, from 167 to 139. Had this total been considerably less there would have been more general satisfaction on the part of those responsible for teaching in the Faculty of Medicine. The serious disadvantages of the present large classes in the fourth, fifth and sixth years has been emphasized in the past two years by the heads of all clinical departments. Recommendations have been made by the Council of this faculty to provide alleviation from the present undesirable condition which, it is hoped, may soon receive sympathetic consideration and provide the basis for suitable action. This would be in the interest of the public, the medical profession and of present and prospective medical students. One hundred to one hundred and ten students in each of the first three years falling to ninety or one hundred in the three clinical years would relieve the present very severe strain upon the hospital facilities now available. Limitation of registration in the Faculty of Medicine in this University would, in the judgment of those who have given the question most serious and sustained consideration, be followed by very real advantages. I wish at this time to again recommend that such action be taken.

The continued reduction in university grants necessitating the complete elimination of funds for the support of research in the clinical departments is greatly regretted; a serious situation to which attention must again be directed. The importance and significance of recent advances in medicine are well known and generally appreciated. These advances have been made possible by generous support of research and investigation. Their continuation and extension will only be possible if suitable conditions obtain. These include appropriations for the work of the Committee for Experimental Research in Medicine. It is earnestly hoped that these may soon be forthcoming once more.

In the meantime the generous and helpful assistance provided by Sir Frederick Banting from the appropriations of the Department of Medical Research and of Professor C. H. Best from those of the Medical Research Best Fund are gratefully and appreciatively acknowledged. The Connaught Laboratories, also, have assisted in providing grants and research facilities. From these three sources it has been possible for the faculty to continue to provide conditions favourable for medical research. The fruits of such goodwill and genuine spirit of co-operation are not likely to be disappointing. The opening of the Ontario Institute of Radiology was a most significant event during the year. Extended reference to this new and important undertaking is made in the reports of the Departments of Radiology and Surgery by Doctor G. E. Richards and Doctor W. E. Gallie.

Faculty committees have been active and progressive throughout the year. Curriculum and Examinations under the chairmanship of Professor Duncan Graham, Library under Professor V. E. Henderson and Applications and Memorials under Professor F. B. (now Dean) Allan, among others, have been much occupied with faculty matters of importance. In this way consideration and study of questions of importance are thoroughly canvassed and explored before appropriate action is taken. This valuable but unobtrusive work receives but little general attention. It is here desired to acknowledge it with warm appreciation. In this connection, furthermore,

it is especially appropriate to express to Professor Allan, thanks for many years unsparing and painstaking efforts as Chairman of the Committee on Applications and Memorials and at the same time to extend to him hearty congratulations upon his appointment as Dean of the Faculty of Arts.

Last year reference was made to the organization of the Toronto Physiological Society. This continues to be a real vitalizing influence; inter-departmental in scope; of value to graduate and undergraduate students and to members of the staffs of several departments in this faculty. The museum in the Department of Anatomy has been reorganized and greatly extended by Professor Grant and his colleagues. It is now, more than at any time in the past, a most valuable repository of material of great interest and importance. Many details of structure are susceptible of clear and lucid demonstration in judiciously chosen models and specimens. Professor Grant is to be congratulated upon having succeeded to a marked degree in the realization of a most worthy objective.

This faculty believes firmly in the soul-refreshing practice of the cult of great men. To commemorate the life and work of the immortal Lister a celebration was held in Convocation Hall on April fifth. On that day the seventh Donald C. Balfour lecture in Surgery was given by Doctor William D. Haggard, Professor of Clinical Surgery, Vanderbilt University Medical School. The title of Doctor Haggard's very interesting address was "The Seeds of Time". The lecture was well attended and greatly enjoyed. His Honour the Lieutenant-Governor, Doctor H. A. Bruce, Emeritus Professor of Clinical Surgery, very graciously and delightfully entertained at luncheon at Government House for Doctor Haggard and for the President of the University, the heads of departments and others.

This year, Professor James Ewing of the department of Oncology, Cornell University, and Director of Cancer Research, Memorial Hospital, New York, was awarded by the Senate the Charles Mickle Fellowship. This Fellowship is given under the terms of the deed of gift of the benefactor, "to

that member of the medical profession who is considered by the Council of the Faculty of Medicine to have done most during the preceding ten years to advance sound knowledge of a practical kind in medical art or science''. Professor Ewing's activities in the field of cancer research thoroughly justify this action and is but one of many distinctions which have come to him.

Recognition has, during the year, come to various members of the faculty. Outstanding among these and thoroughly merited was the honour paid to Professor Perry G. Goldsmith in his selection as President of the American Laryngological, Rhinological and Otological Society. Doctor Goldsmith was also invited to deliver a series of lectures during the spring of 1934 at the Gill Memorial Hospital, Roanoke, Virginia. Professor Duncan Graham was signally honoured and his colleagues and friends greatly pleased by his election to Fellowship in the Royal College of Physicians of London. This is an especially noteworthy award as Professor Graham previously was neither a licentiate nor member of the College. On the occasion of His Majesty's birthday honours Professor Frederick Grant Banting was made a Knight Commander of the Order of the British Empire for distinguished service to science and humanity. This award was received with popular acclaim and throughout the length and breadth of this and other countries, the great contribution of Sir Frederick Banting to the alleviation of human suffering was recalled with gratitude.

Professor C. H. Best in January was highly honoured in being invited to deliver lectures at Cambridge University and the University of London. Professor V. E. Henderson and Professor G. H. W. Lucas received further recognition of their work in the field of anaesthesia. Doctor K. C. McIlwraith was made Emeritus Professor of Obstetrics, a well-merited reward for many years of faithful service. Honorary Fellowship in the Royal College of Surgeons of England was conferred on Sir Frederick Banting in October 1933. The Dean of the Faculty was invited by the President of the Rockefeller Foundation to visit India, Ceylon and Egypt,

during the winter, as a member of a small commission visiting those countries on behalf of the Foundation. The Dean was again chosen as a member of the Health Committee of the League of Nations for a three-year period, and elected Chairman of the Scientific Directors of the International Health Division of the Rockefeller Foundation for the year 1934. During the year Thomas Motton, for forty-three years a faithful member of the non-academic staff of the University, retired on pension. As caretaker of the Medical Building for thirty years he was well and affectionately known as 'Tom' to a host of students and to many past and present members of the teaching staff. May he long enjoy well earned years of leisure.

From the headship of the Department of Therapeutics Professor R. D. Rudolf retired on June 30th, 1934. Professor Rudolf has in more than one capacity served the University through this faculty with great loyalty and devotion. For many years a teacher of clinical medicine who commanded the respect and regard of his students, he has in recent years devoted himself to furthering the interests of therapeutics. His work and efforts are here most gratefully acknowledged. Doctor Gilbert Royce has, after many years of unselfish service, retired as Associate Professor of Oto-Laryngology. The thanks of the faculty and all best wishes for the future are extended to him on behalf of the Council of this faculty. Doctor H. E. Clutterbuck and Doctor C. H. Hair have retired from the staff in the department of surgery. Their services as clinical teachers have been much appreciated and the thanks of the faculty are extended to each of these gentlemen. Grateful acknowledgment, too, is made of the gift of the library of the late Mr. I. H. Cameron, Professor Emeritus in Surgery in this University. Also of the gift of Doctor Frederick John Poynton of London, England, of the original manuscript of his book on the etiology of rheumatism (acute rheumatic fever). This unique contribution is highly prized and the kind offices of Doctor George Pirie of the staff in pædiatrics, in this connection, is warmly appreciated.

Extra-mural post-graduate lectures under the aegis of

the Canadian Medical Association and of the Ontario Medical Association have been given by many members of this faculty as for a number of years past.

It is with deep and abiding regret that the death of the following members of the University staff or students in this faculty must here be chronicled: Professor B. A. Bensley, for twenty years professor of zoology and head of the department of biology. A colleague and teacher held in the highest esteem, his sudden passing was a great shock. Mr. I. H. Cameron, Emeritus Professor of Surgery and former head of the department, died December 15th, 1933. A distinguished scholar, honorary fellow of the Royal Colleges of Surgeons of England, Scotland and Canada, Mr. Cameron for many years occupied a unique place in the medical profession in this country. His many former students will mourn the death of a scholar and gentleman who stood for all that was best in the profession of medicine. Doctor F. A. Cleland, a former assistant professor (1922-1928) of obstetrics and gynaecology, died November 26th, 1933. Doctor Cleland was an excellent teacher, a fine surgeon and a most loveable man. His death has brought sorrow to his former colleagues and friends in this faculty. Doctor W. H. Dickson, associate in radiology, died suddenly on October 30th, 1933, at a very early age. He was an exceedingly valuable member of the staff and a man of great energy with much charm of character. His loss we sincerely mourn. John H. C. Copp, fourth year medical student. John Copp's tragic death in December, 1933 cast a deep gloom over the whole University and this faculty lost a student of splendid character and attainments. Doctor W. J. Hendry, Ellen Mickle Fellow for 1933-1934. "Jack" Hendry's sudden death in Johns Hopkins Hospital during his tenure of the Ellen Mickle Fellowship caused profound sorrow and regret among a wide circle of friends in this faculty. A brilliant student at the threshold of a career of great promise, his passing is profoundly regretted. Doctor H. S. Hutchison, assistant professor of medicine, died with startling suddenness on January 6th, 1934. He was an excellent teacher, a fine clinician, a splendid man and his large circle of friends and

colleagues feel deeply the loss of a well-loved and loyal associate.

Last year the retirement of Doctor F. N. G. Starr from the Faculty of Medicine and his appointment to the Board of Governors of the University was announced. After a very brief illness Doctor Starr died on April 21st, 1934. For those at any time associated with the Faculty of Medicine during the past thirty-six years it is difficult to realize that one so long active in the teaching and practice of medicine is no longer with us. A surgeon with an international reputation, Doctor Starr combined very unusual qualities of heart and mind which endeared him to a host of students as well as to his colleagues and close associates. His services to this faculty, to the promotion of the best interests of medicine and to community welfare will not quickly be forgotten. His death has caused a host of loving friends to mourn his loss.

Just after the close of the session 1933-1934, on July 5th, Victor John Harding, since 1920 professor of pathological chemistry, died after a long illness borne with great courage and fortitude. Professor Harding was an able teacher, an excellent investigator with a fine original mind. He was, despite long-continued and serious disability, active and vigorous in the prosecution of research in his own field. For many years as Chairman of the Microscope Committee and in various other ways he rendered splendid service to this faculty. His early demise is a great loss to the University as it is also the source of great sorrow on the part of his colleagues and friends. Professor A. B. Macallum a former member of this faculty, died in London, Ontario, on April 8th, 1934. Professor Macallum was a physiologist and biochemist of great distinction with a world-wide reputation. He was for twenty-seven years exceedingly active in the affairs of this University. His death is deeply regretted.

The following appointments and promotions were made in the Faculty of Medicine by the Board of Governors during 1933-1934:

APPOINTMENT: July 1, 1933.

Dr. G. F. Marrian—associate professor of biochemistry.

PROMOTIONS: July 1, 1934.

Professor F. B. Allan—to be Dean of the Faculty of Arts.

Professor E. M. Walker—to be head of the department of biology.

Professor L. Irving—to be professor of experimental biology.

Dr. R. F. Farquharson—to be assistant professor of therapeutics and head of the department; to be assistant professor of medicine.

Dr. W. F. McPhedran—to be assistant professor of medicine.

Dr. W. L. Robinson—to be professor of pathology.

Dr. H. E. Clutterbuck—to be assistant professor of surgery (resigned June 30th, 1934).

Dr. G. E. Richards—to be associate professor of radiology.

Dr. R. Pearse—to be assistant professor of surgery.

Dr. N. E. McKinnon—to be associate professor of hygiene and epidemiology.

Dr. W. R. Franks—to be assistant professor in the department of medical research.

The Canadian Medical Institute has donated a prize of twenty-five dollars to that student in the sixth year in medicine who is adjudged to have written the best essay on the value of an Annual Periodic Health Examination. This contribution is appreciated and thanks are expressed to the donors.

The reports of heads of the various departments; of the Medical Arts Service; notes from the Assistant Dean's office; details of registration; reports of the Medical Society, of the Medical Athletic Association and of the Medical Women's Undergraduate Association will be found hereunder. To my colleague Doctor E. Stanley Ryerson, assistant dean and secretary of this faculty, who acted as Dean for the period December 15th, 1933 to March 15th, 1934, I beg to convey thanks and appreciation.

J. G. FITZGERALD, M.D., *Dean*.

NOTES FROM THE ASSISTANT DEAN'S OFFICE

MEDALS, PRIZES, SCHOLARSHIPS AND FELLOWSHIPS

Awarded by the Senate of the University,

JUNE, 1934

SIXTH YEAR

Gold Medal.....	Miss J. C. Gray, B.A.
Silver Medal.....	T. Kajiyama, B.A.
Silver Medal.....	R. C. Dickson
The Ellen Mickle Fellowship.....	R. L. Noble
The Chappell Prize in Clinical Medicine.....	Miss J. C. Gray, B.A.
The Ontario Medical Association Prize in Preventive Medicine.....	Miss J. C. Gray, B.A.
The David Dunlap Scholarship.....	R. L. Noble
The Canadian Medical Institute Prize.....	R. C. Dickson

UNDERGRADUATE

The David Dunlap Scholarships, Fifth Year.....	No Recommendation
Third Year.....	J. L. Cathie
The Baptie Scholarship.....	T. P. Keast, B.Comm.

GRADUATE

The Reeve Prize.....	D. L. Selby, B.A., M.D.
The Lister Prize in Surgery.....	H. F. Mowat, M.D.

OTHER AWARDS

No. 4 Canadian General Hospital Scholarships.....	B. J. Woods, B.Sc. W. L. M. King H. V. Rice
The John McCrea Memorial Scholarship.....	O. M. Solandt, M.A

REGISTRATION OF STUDENTS IN THE FACULTY OF MEDICINE

SESSION 1934-1935

	Men	Women	Total
First Year.....	130	8	138
Second Year.....	155	14	169
Third Year.....	136	8	144
Fourth Year.....	118	9	127
Fifth Year.....	124	7	131
Sixth Year.....	103	9	112
D.P.H.....	12	00	12
B.Sc. (Med.).....	4	00	4
D. R.....	1	00	1
Post Graduate.....	2	3	5
Occasionals.....	3	1	4
	788	59	847

DEPARTMENT OF ANATOMY
(Under the direction of Professor J. C. B. Grant)

There were working in the Department of Anatomy during the session 1933-34:

Medical Students:

Second Year.....128

Third Year.....128

Biological and Medical Sciences:

Third Year..... 26 (with second year medicine)

Fourth Year..... 18 (with third year medicine)

Honour Psychology Students:

Third Year..... 6 (Neurology with third year
medicine)

Dental Students:

Second Year..... 43

Physiology and Biochemistry:

Third Year..... 4 (Histology)

Post Graduate Students:

Histology..... 2

Gross Anatomy.... 1 (Occasional)

Anatomy..... 8 (Night class for House Surgeons)

Neurology..... 1

Total.....365

Of these a number elected Anatomical subjects as options as follows:

II Year Cytology..... 3 (Dr. Piersol)

III Year Special Histology..... 66 (Dr. Ham)

IV Year B & M—Special Histology.... 3 (Dr. Ham)

IV Year—Special Gross Anatomy..... 18 (Dr. Watt)

V Year—Special Senses..... 5 (Dr. Linell)

Courses in Elementary Anatomy were given, as follows:

Graduate Nurses from School of

Nursing..... 8 }
 First Year in Physiotherapy..... 7 } (Dr. George)

A course of 8 lectures was given by Dr. Cates to 16 students of the College of Optometry.

The various lectures were duly delivered. The practical classes were conducted as prescribed in the calendar. The various written and practical examinations were held periodically, much as they were last year.

In recent years many applications for the vacant demonstratorships have been received. As it has been the policy to allocate these posts to graduates who propose to proceed to some further degree or fellowship, and as the successful applicants are required during their first term of office to attend the lectures given to the undergraduates and also the advanced class conducted by the head of the department, one has considerable assurance that the junior members of the staff will be interested in, attentive to and prepared for their work.

The tutorial classes—these the demonstrators conduct—have been in the past I find, too large to produce the best results. It is therefore decided next year to split each tutorial class into two, with about fifteen students to a class. The benefits we expect to arise from this need no explanation. Breaking a class of one hundred and fifty up into groups of fifteen will mean a great deal of repetitive tutorials each week.

The advantages and high desirability of possessing a fellowship in medicine or surgery is coming to be appreciated by the students, and as a result, the number proposing to sit the primary examination for the F.R.C.P. or S. of Canada will increase markedly this year. This is gratifying. The high standard demanded at the fellowship examination has inspired those who would have been content with a pass mark in anatomy, leading to their M.D. examination, to aim much higher.

This Department has lacked a teaching museum. A useful museum, which students will frequent of their own will, can be of great value, as it allows students to inspect a dissection before they make one for themselves in the dissecting room, and subsequently it allows them to refresh their memories. With this in mind I have devoted, during the

last three years, much time to the development and formation of a museum for teaching purposes. In this I have had the ingenious assistance of Dr. Guyatt, Mr. E. M. Davidson and a few others, with the result that it has now achieved presentable proportions. Several specimens and dissections are added weekly. Each of these is attractively illustrated and carefully labelled. The value of such a collection is determined largely by the method adopted in displaying it.

The department was fortunate in being able to take advantage of an offer to improve materially its X-ray equipment.

DEPARTMENT OF MEDICAL RESEARCH

(Under the direction of Professor F. G. Banting)

Dr. F. G. Banting and Miss S. Gairns have carried out experiments in the endeavour to produce resistance to Rous sarcoma.

Dr. G. H. Ettinger has investigated, with the assistance of Mr. J. A. Romeyn and Mr. F. L. Harrison, the effects of low voltage electrical currents upon the heart of the cat, and of electrical shock upon the tension of carbon dioxide in the expired air of the same species.

Mr. G. E. Hall has been investigating a possible relationship between peptic ulcer and the chemical products of autonomic nerve stimulation.

Dr. Ettinger and Mr. Hall have been collaborating on the following problems:

(a) The effect of long continued administration of acetylcholine upon the circulatory system of the dog.

(b) An estimation of the acetylcholine content of the blood of the ox and dog.

(c) An estimation of the esterase content of the blood of domestic animals and of man under conditions of health and disease.

Dr. D. A. Irwin applied micro-incineration methods to the study of siliceous fibrosis and by the addition of acid extraction to this method, was able to make a differential diagnosis between a tuberculous and silicotic nodule.

Dr. Irwin and Dr. King tested Dr. W. D. Robson's hypothesis concerning the effect of gas on the production of silicosis, and it was found that dilute irritating gases mixed with quartz dust gave rise to an early fibrosis. The same gases with sericite dust did not produce fibrosis.

Dr. Fallon and Dr. Carrow studied the effect of certain fractions of pregnant urine on the growth of tumors and found that it had no effect.

Dr. Fallon is investigating the early changes produced in subcutaneous tissues by the injection of silica particles.

Mr. H. J. Perkin, Dr. B. R. Brown and Miss J. Lang have developed an iodine tolerance test which indicates that the curve of blood iodine following a single dose of Lugol's solution is lower in hyperthyroid patients than in normal persons.

Dr. M. Mitchell studied the effect of finely divided carbon on the toxicity of diphtheria toxin. With Dr. LeMesurier, of the Surgical Staff of the Hospital for Sick Children, he conducted experiments on ischemic paralysis.

The work on the machine to remove dust from mine air has been continued by Dr. W. R. Franks. A unit assembled under the auspices of the Ontario Mining Association has been tried out in the mines. This dust precipitator was found to reduce dust formed by a blast in a mine drift from 15,000 particles per cc. to 200 within half an hour. Thus the principle of electrical precipitation has been established. However, many difficulties have arisen in connection with the practical application—the present design of the machine is unsatisfactory. Further experimentation must be done both on the design of the machine and on the study of the fumes from the exhaust.

With the assistance of Miss L. C. Tresidder and the co-operation of the Porcupine group, Dr. Franks has developed a new photometric method of estimating dust. Among other advantages this does away with the tedium of counting. The method should materially aid in co-operating dust exposure with clinical findings. During the year instruction in the method has been given to interested members of the gradu-

ating class in Mining Engineering, also to a graduate student at Queen's University.

With the assistance of Miss A. J. Watt, the in-vitro study of the development of silicosis has been undertaken by the method of tissue culture. Phagocytosis of siliceous dust by monocytes has been studied to date.

Mr. L. D. Proctor and Dr. Franks have investigated the mechanism of the action of lactate on fermentation in tumor. Toxic methylglyoxal has been isolated in vitro from the products of hexosephosphate fermentation in presence of lactate.

Dr. Franks and Miss M. M. Shaw studied the effect of inhibition of fermentation in tumor by lactate and iodoacetic acid after radiation. About 20 per cent. regressions resulted in the iodoacetic acid group.

Miss E. L. Batho and Dr. Franks are studying the possible synthesis of a specimen antigen from tumor. The effect of synthetic analine and naphthaline antigen complexes on tumor transplantability has been studied.

Dr. E. J. King and Miss M. E. Dolan have continued the investigation on the metabolism of silica, and have demonstrated that soluble silica is absorbed from the lung into the blood and excreted in the urine. The effect of diet on the excretion of silica has been studied.

In collaboration with Dr. T. H. Belt, of the Department of Pathology, Dr. King, Miss Dolan and Dr. D. A. Irwin have made a study of the distribution of silica in a wide variety of human tissues.

Mr. E. L. Outhouse has made a study of the chemistry of phosphoric esters occurring in malignant tissue. An alcohol insoluble barium salt has been isolated which contains amino nitrogen as well as phosphate; it is non-reducing and does not give a Molisch reaction.

Miss H. Tait has made a study of the oxygen uptake of various fatty substances with glutathione in the Barcroft apparatus. Lecithin takes up more oxygen than free fatty acids or glycerides. The unsaturated fatty acids from lecithin are not oxidized as rapidly as the parent phosphatide.

Mr. J. K. Watson has investigated the possibility of estimating small quantities of silica by precipitating with organic bases the complex acid which silica forms with molybdate.

Mr. A. C. Medcalf, of the Chemistry Department, has worked part time in this laboratory during the year. He has studied the enzymic hydrolysis of the phosphatides—lecithin, kephalin, brom-lecithin and brom-kephalin—by lipase and by phosphatase.

Dr. A. R. Armstrong and Dr. King have elaborated a procedure for the clinical estimation of phosphatase, using phenyl phosphate as the substrate, which is more simple than previously described methods and more quickly carried out.

Dr. A. R. Armstrong and Dr. King, with Dr. R. I. Harris of the Department of Surgery, investigated the serum phosphatase in cases of obstructive jaundice. They also followed the serum phosphatase of obstructive jaundice produced experimentally.

Dr. Botterell of the Department of Surgery and Dr. King studied phosphatase in fracture cases from the wards of the Toronto General Hospital, and in experimentally induced fractures.

Dr. T. G. H. Drake and Dr. J. R. Ross of the Hospital for Sick Children, have collected a large number of blood samples from infants and children for phosphatase estimations in this laboratory. In this study a micro-method, which was worked out by Dr. Armstrong and Miss Tait, has been used to determine the phosphatase activity on the very small amounts of blood obtainable from these cases.

Professor C. C. Lucas of Brandon College, spent the summer of 1933 in this Department, as holder of the Dr. James Page Rutherford Scholarship. He continued his work on the chemistry of the cysteine-like substance which he isolated from urine; and collaborated with Dr. J. R. Ross of the Hospital for Sick Children, in the elaboration of a new and delicate method for the determination of minute amounts of lead in biological material.

During the year the Department has enjoyed the helpful

- co-operation of the Departments of Pathology, Surgery and Medicine.

We also wish to thank Professor H. E. T. Haultain, of the Department of Mining Engineering, Professor T. L. Walker of the Department of Mineralogy, and Drs. Cunningham, Riddell and Brink of the Division of Industrial Hygiene, Ontario Department of Health, also Professor W. R. Graham, of the Department of Poultry Husbandry, Ontario Agricultural College, for their assistance and co-operation. We wish to especially thank the Ontario Mining Association for their wholehearted co-operation and financial assistance in the work on silicosis.

During the three months' absence of the head of the Department, the administration was carried on by Dr. D. A. Irwin.

DEPARTMENT OF BIOCHEMISTRY

(Under the direction of Professor H. Wasteneys)

There have been no changes in the organisation of the department during the year. We have continued to give laboratory accommodation to students from the Department of Household Science. Since these students occupy alternate lockers in the laboratories during periods when they are not required by the medical students, and since the Department of Household Science provides its own instructors, very little inconvenience is occasioned and I have no hesitation in recommending a continuance of this arrangement.

The most important change in the staff was the appointment of Dr. G. F. Marrian to an Associate Professorship. He has had full charge of advanced students and has been busily occupied in the inauguration of researches on the chemistry of the hormones. One of the junior members of the staff, Mr. H. W. Lemon, resigned in January to accept an appointment on the staff of the Ontario Research Foundation. Mr. S. Cohen, a graduate student from Brandon College, Manitoba, was appointed in his place.

The number of graduate students in the department was

26. Four of these will graduate as Doctors of Philosophy, majoring in biochemistry, this month. Two students who have also majored in biochemistry will have graduated as Masters of Arts.

Thirteen graduate students have been engaged in research work under the direction of senior members of the staff.

The total number of students registered in the department during the session 1933-34 was 252. This number was made up of 131 medical students, 30 students in the B & M course, 6 chemistry, 6 P & B, 10 Biology, 2 Household Economics, 1 General, 42 Dentistry and 26 graduate students. Of the graduate students, 16 were candidates for the Ph.D. degree, 7 for the M.A., 1 for the M.S.A. and 1 for the B.Sc. (Dent.). Eight were taking biochemistry as a minor for degrees in other departments, 2 were taking biochemistry as a prerequisite to other graduate courses and 7 students have taken work as a major or a minor in Zymology.

Changes were introduced during the year in the nature of the instruction in the course given to the advanced students. The lectures in this course are changed annually, since recent developments in biochemistry are chiefly dealt with. This year some changes have also been made in the nature of the work covered in the laboratory course. These changes have been in the direction of providing more experience in the making of biochemical preparations and in quantitative procedures.

It is intended next year to revise also the teaching in the undergraduate laboratories with a view to eliminating a good deal of repetition of qualitative procedure and providing more training in quantitative methods.

The departmental seminars have been well attended. These seminars are confined mainly to members of the department in order to obtain freer discussion, but visitors have however been frequent and are also welcome.

I cannot close this report without making reference to the severe loss suffered by the department in the death of Mr. A. E. Giddens who was a most valued member of our laboratory staff for over thirty years.

DEPARTMENT OF HISTORY OF MEDICINE
(*Under the direction of Professor J. H. Elliott*)

The course of lectures laid down in the curriculum of last year was given. These were illustrated by lantern slides, and by exhibits of books regarding important contributions to the progress of medicine. There is a gratifying increase in the interest in this subject shown from year to year by the student body.

Invitations were accepted to give lectures outside the University as follows, including three dealing with the early physicians and surgeons of Toronto.

A. February 13th, 1934. The Samaritan Club

The History of Tuberculosis Work in Ontario.

B. February 24th, 1934. Royal Canadian Institute

The Surgeons of York and the part they played.

C. March 17th, 1934. Ann Arbor

The Study of the History of Medicine.

D. March 24th, 1934. Friends of Italy

Italy in the History of Medicine.

E. April 7th, 1934. Caduceus Club

The First Forty Years of Medicine in Toronto.

F. May 22nd, 1934. American Clinical and Climatological Association

The Early Practitioners of Toronto.

DEPARTMENT OF HYGIENE AND PREVENTIVE MEDICINE
INCLUDING SUB-DEPARTMENT OF CHEMISTRY IN RELATION TO
HYGIENE

(*Under the direction of Professor J. G. FitzGerald*)

The enrolment of graduate students in the course leading to the Diploma in Public Health for the session 1933-34 numbered thirteen. The following provinces were represented, Quebec, Ontario, New Brunswick, Manitoba and British Columbia. It is a pleasure to report that one student came from the United States to qualify himself for an academic

post in the department of public health and preventive medicine at Stanford University. Ten students were on fellowship; seven Rockefeller Foundation and three Connaught Laboratories.

It is of interest to note that since the opening of the School of Hygiene in 1927, seventy-six students have completed their studies for the Diploma in Public Health. Of these the greatest number have been from the province of Quebec with a total of twenty-nine; Ontario, twenty; other provinces, twenty-six; United States, one. Most of these students have been on fellowship; Rockefeller Foundation, thirty-six; Connaught Laboratories, twenty-two; School of Hygiene, four. Within the past few years health departments throughout the Dominion have continued to avail themselves of the opportunity of obtaining qualified and trained personnel.

Three graduate students completed the course in bacteriology and immunology; one completed bacteriology only. Since 1928 fourteen students, most of whom were registered for the degree of doctor of philosophy in the Department of Biology, have enrolled in these courses. It is refreshing to have this group of students in the classes because of their broad biological training.

Two candidates from this department will present themselves for the final oral examination for the degree of doctor of philosophy this year. Miss H. Plummer has subjected a new method of assay of streptococcal toxin and antitoxin to a statistical analysis and has extensively explored the factors concerned in the production of toxin by the haemolytic streptococcus. Miss Doreen Smith, in the sub-department of Chemistry in relation to Hygiene, under Professor P. J. Moloney, has carried on an investigation into the detoxifying action of bile upon diphtheria toxin. Investigations under Professor Moloney have been carried out which have contributed to the knowledge of the following topics: the purification of diphtheria toxoid, and the preparation of broth for the production of diphtheria toxin of high potency.

Dr. Randolph J. Gibbons, the first appointment to be made as fellow in Hygiene and Preventive Medicine relin-

quishes his post as fellow this year, after a tenure of two years. He has successfully investigated certain problems in the bacteriology of dysentery and developed a method of applying cinematographical technique to the study of single cell cultures.

Students of the fifth year in medicine received the usual instruction in Preventive Medicine. The department has been fortunate in securing the teaching assistance for certain of the lectures and laboratory exercises, of Dr. James Craigie of the Department of Epidemiology and Biometrics, who has made signal progress in the field of filterable viruses.

Lecture and laboratory courses were given to students of the School of Nursing and lecture courses to students of the Faculty of Household Science and the Faculty of Arts.

The department has, as in previous years, enjoyed the generous assistance of the Department of Health, Ontario and the Department of Public Health, Toronto. The success of the Field Course given to students of the fifth year medicine and the field excursions of students proceeding to the diploma is in large measure dependent upon this efficient co-operation.

The enrolment for the session has been as follows:

Graduate.....	19
Faculty of Medicine, Fifth Year.....	112
Faculty of Household Science, Fourth Year	44
Faculty of Arts, Third Year.....	36

DEPARTMENT OF MEDICINE

(Under the direction of Professor Duncan Graham)

During the past year no essential changes have been made in the organization for clinical instruction to students. The increase in the number of students registered in the clinical years is proving a serious handicap to effective clinical instruction.

The Department of Medicine records with deep regret the death of Professor H. S. Hutchison, Physician-in-Charge of the Medical Out-Patient Department of the Toronto

General Hospital. For twenty-five years he was a member of the teaching staff. By his death the department loses an able teacher and an outstanding physician, and his colleagues a loyal associate and friend.

Two graduates of the University have joined the staff of the department: Dr. Robert A. Cleghorn and Dr. J. A. Dauphinee. After serving one year as an interne in the Toronto General Hospital, doing three years' graduate work in physiology with Professor Macleod in Aberdeen and one year of special work on the Continent,—Dr. Cleghorn has been appointed a whole time member of the staff. He is interested in a study of the relationship between disturbances of the endocrine glands and the development of nervous disorders.

After graduating in Arts from the University of British Columbia, Dr. Dauphinee registered in the University of Toronto as a graduate student in Biochemistry and obtained the Degree of Doctor of Philosophy. In 1929, he graduated in Medicine and was the recipient of the Ellen Mickle Fellowship, the highest award the Faculty of Medicine can confer on an undergraduate. After a year spent in clinical research with Professor Francis Fraser of St. Bartholomew's Hospital, London, and two years as an interne in the Toronto General Hospital, he has joined the staff as a Research Fellow in Medicine. This year he is the holder of the George Brown Memorial Scholarship in Medical Science.

Dr. Farquharson is about to publish a valuable contribution to our knowledge on the effect of the continued administration of large amounts of irradiated ergosterol to patients suffering from post-operative parathyroid tetany.

Dr. Farquharson, with Dr. Mills of Montreal and Dr. McHenry of the Connaught Laboratories, has reported upon the use of intramuscular liver extract in the treatment of pernicious anaemia. The extract used for these investigations was made in the Connaught Laboratories of the University.

Dr. Hyland, in association with Dr. Farquharson, has made a most careful neurological examination on patients

suffering from pernicious anaemia, both before and during treatment. At the present time over one hundred and fifty cases are under careful observation. The beneficial effect of adequate liver therapy on the neurological manifestations present in pernicious anaemia observed and reported on some years ago has been amply confirmed in this more recent observation.

Dr. Hyland has published an important report correlating the clinical significance with the pathological findings in cases of thrombosis of the different intercranial arteries.

Dr. Warner has made another important contribution to the investigation of bronchiectasis.

Dr. Rykert, who is the holder again this year of the Alexander McPhedran Fellowship in Clinical Medicine, has made some interesting and important observations on the electrocardiographic changes developing in certain patients with hypertension.

In the course of his investigations on the arginase content of the blood in cancer, Dr. Dauphinee has found that it is not increased. This is contrary to the findings of Haddow. He has made the interesting observation that an increase in the arginase content of the blood is present in patients suffering from pernicious anaemia and that this increase disappears under adequate liver therapy. The possible significance of this interesting finding is being investigated.

Dr. Cleghorn has been interested in the preparation and assay of cortical extract from the suprarenals. He has been studying the effects of administration in mice. The Connaught Laboratories have very kindly offered facilities for the preparation of the extract and the advice and assistance of their staff in this work. Through the generosity and kindness of J. S. McLean, Esq., supplies of suprarenals have been provided.

In the field of Dermatology, Dr. Wrong has published two interesting reports on psoriasis.

Satisfactory progress is being made in the investigation of other problems, some of which have been referred to in earlier reports.

SUB-DEPARTMENT OF PAEDIATRICS

There have been no essential changes in the activities of the Sub-Department of Paediatrics during the past year. The policy of close co-operation with other departments of the University is now bearing fruit. As a result of our co-operative work with the Connaught Laboratories the lives of two children have been saved through the institution of more intensive treatment of tetanus with antitetanic serum. Also, most interesting and practical work is being done on the development of effective whooping cough vaccine.

The continued use of the oxygen tent, which was first used in this Department through the co-operation of the Department of Physiology, and the use of the Drinker Apparatus, has resulted in the saving of many lives.

Working in conjunction with the Department of Pharmacology, interesting and informative studies on the treatment of anaemias in children have been undertaken.

With the assistance of members of the dental profession we have shown that additional amounts of vitamin D have markedly reduced the incidence of tooth decay in children living under what have been formerly considered excellent hygienic and dietetic conditions.

In a joint effort with the Department of Psychology it has been shown that dietary defects in animals during early life can interfere with their learning ability. The possible application of this to human conditions is obvious.

Through our association with the Banting and Best Department of Medical Research valuable studies have been instituted on the subject of lead poisoning. This condition is frequently encountered in children, and these new researches indicate that many cases which were previously undiagnosed are now found to be suffering from this condition. Therapeutic methods have been instituted which have lowered the mortality in this disease.

Nutritional studies are being continued, and information is being obtained which indicates that our diets, which we previously considered adequate, are still not optimal, and

measures are being taken to correct these deficiencies. In regard to this work, it is of interest to note that the advice of members of the Laboratory staff has been sought on nutritional problems by the Ontario Medical Association, the National Dairy Council of Canada, the Agricultural College, the Pacific Fisheries Experimental Station, and also in connection with the dietary relief problems of Newfoundland.

DEPARTMENT OF OBSTETRICS AND GYNAECOLOGY

(Under the direction of Professor W. B. Hendry)

The teaching of the students of the fifth and sixth years was carried out according to the curriculum. In this connection an experiment in teaching groups of three students in each of the gynaecological clinics was undertaken and appears to have met with success.

Investigations are being made by Dr. D. N. Henderson concerning the clinical value of endocrine therapy in connection with disturbances of menstruation, the results of which will be published later.

Dr. John Mann has brought to perfection an obstetric forceps involving the principle of a movable joint, which will be of great value in the practice of obstetrics.

Dr. W. G. Cosbie is continuing his investigations into the value of thorotrast as a diagnostic aid in obstetrics.

Drs. H. B. VanWyck and Mann are continuing their work in connection with the toxæmias of pregnancy.

Dr. J. C. Goodwin is pursuing his study of racial characteristics in their relation to labour.

In co-operation with the departments of urology and radiology, a study of the ureteral changes occurring throughout pregnancy is being made, the results of which will be published later.

DEPARTMENT OF OPHTHALMOLOGY

(Under the direction of Professor W. H. Lowry)

This year's students exhibited marked interest in their work and most of them showed average skill in the use of the

ophthalmoscope, while some of them showed marked ability to recognize conditions with the ophthalmoscope. This, I feel will make them useful practitioners in the communities where they might happen to practice.

Dr. MacDonald examined and made sections of fifty-nine specimens. Of these, nine were referred from the Provincial Laboratories of the Province of Ontario.

The Staff was asked for consultation in a large number of cases from the Medical, Surgical and Obstetrical departments. This has proven to be very interesting work and has been of great value in the teaching of the younger members of the Staff and the House surgeons, in charge of these cases.

I wish to express my appreciation of the interest and enthusiasm of the individual members of the Ophthalmology staff, who have worked harmoniously and faithfully throughout the year.

DEPARTMENT OF OTO-LARYNGOLOGY

(Under the direction of Professor P. G. Goldsmith)

The Department of Oto-Laryngology has nothing of special importance to bring before you so far as the teaching of the subject is concerned. You are reminded that in a former report, I stressed the difficulty experienced in teaching owing to the large number in each class. Individual instructions and demonstrations on patients demand more time than is available, and a type of patient who does not resent being kept for students' manipulation. Nevertheless, the importance of the subject in relation to the problems of caring for the common ailments of the public, is constantly kept in mind. The therapy taught students is that obtaining under sound conservative methods.

The amount of special anatomy given the fifth year students has probably been excessive in the past. This will be corrected and more time given to the use of instruments and clinical examination of the patients.

The pathological work of diseases of the Nose, Throat and Ear has been carried out by Drs. McGregor and McLeod.

The head of the department and Dr. McGregor have continued to act as examiners on the American Board of Oto-Laryngology. Dr. McLeod has constructed a series of Plaster Models of the operation of Laryngectomy. These evoked much favourable comment at the Meeting of the American Laryngological, Rhinological, and Otological Association at Charleston, North Carolina, last May.

The Professor of Oto-Laryngology has been honoured by being elected President of the American Laryngological, Rhinological, and Otological Association, and this Society will meet in Toronto next year.

Dr. Gilbert Royce, who for many years has been my chief assistant, has resigned. I cannot pay a higher tribute than to say, he was faithful to his trust and loyal to his chief. He is succeeded by Dr. G. M. Biggs who will, I am confident, continue in his predecessor's footsteps.

The head of the department gave a series of Post-graduate lectures at the Gill Memorial Hospital, Roanoke, Virginia last spring.

DEPARTMENT OF PATHOLOGY AND BACTERIOLOGY

(Under the direction of Professor Oskar Klotz)

The Department of Pathology and Bacteriology has had a very active year. Our major responsibility, the teaching, has of course occupied the bulk of our time and interest. The large classes have taxed to a considerable degree our personnel in maintaining an individual contact with the students. Improvements have been made in the presentation of gross material to the fourth year. We feel now, that we are getting a better balance between the gross and microscopic characteristics of pathology. The fifth year teaching has proved quite satisfactory, lectures being given by our Staff members on selected subjects, and clinico-pathological demonstrations and the presentation of gross material conducted both by our Staff and the members of the Departments of Medicine and Surgery. The sixth year conferences carried on in collaboration with other departments in the Faculty have proved their

worth in correlating pathology with physiology, anatomy and the clinical aspects of the various disease processes.

The services in the routine laboratories are being extended each year. The work in surgical pathology has shown a steady growth with an increase of approximately fifteen per cent. over the previous year and evidences of even greater increases for the coming year. With the establishment of the Radiological Institute and the consequent increased demand upon our services, the Department is being much overtaxed. Plans are being made, however, to enlarge the personnel and equipment to take care of this important new branch of the clinical work.

The Division of Neuropathology is growing rapidly and is reaching that stage where an assistant is badly needed to help work up the enormous amount of very interesting material that is steadily accumulating from day to day. Many of the specimens are interesting as individual cases, others as mass material for statistical purposes.

The autopsy division continues as a very active service and besides elucidating clinical problems it provides very valuable material for teaching purposes.

A large number of voluntary assistants have been taken on for Summer work. They are distributed throughout the subdivisions of the Department and are used as assistants in carrying on the routine work. The students who avail themselves of this opportunity to obtain a clearer knowledge of pathology derive great benefit from their experience.

Dr. Oskar Klotz leaves this summer for Utrecht, where he is representing Canada at the IIInd Conference of the International Society of Geographical Pathology. He is presenting his studies on experimental arteriosclerosis. He still maintains his interest in yellow fever, and receives specimens from such cases sent in from Brazil, Ecuador, Mexico, Colombia and West Africa.

The museum has had many new specimens added to the collection which are of great value for teaching purposes. The unit system of arrangement of specimens has more than justified the forethought and expense, proving an ideal

system for teaching. It has drawn forth many favourable comments from visitors of other institutions of a similar kind.

We were honoured this year by the presence of the American Association of Pathologists and Bacteriologists, and their affiliated societies, who held their annual meetings at the Banting Institute. The meetings were most successful, and many very favourable comments were heard upon the internal arrangements of our Department. The symposium this year, which was on arteriosclerosis, was lead by Dr. Klotz.

Dr. P. H. Greey, who is in charge of the diagnostic clinic in Bacteriology, is continuing his investigations of actinomycosis in man. He has also been studying the inhibitive effects of arsphenamine on haemolytic streptococci finding that this substance in high dilutions prevents the haemolytic action of these streptococci in media. Dr. R. Margarite Price is still carrying on her special studies on tubercle bacilli from human cases of tuberculosis. Dr. E. J. Clifford is continuing his investigations on the bacterial flora of the intestinal tract with particular reference to metabolic disturbances.

Numerous other studies have been completed by various members of the Staff in Pathology. Dr. G. H. Fetterman—A study of the vascular lesions in surgically excised stomachs; Dr. F. G. S. Christie—Healed syphilitic aortitis; Dr. R. J. M. Galloway—The appearance of the walls of muscular arteries distended at their normal blood pressure; Dr. F. O. MacCallum—Studies on haemolytic *B. coli*; Dr. J. R. E. Morgan—The relation of histamine to inflammation; Thrombo-angiitis obliterans, distribution of the lesion in the leg vessels; Dr. M. V. Rae—Fatal epizootic myocarditis in guinea pigs; Dr. K. A. Roberts—The action of haemolytic streptococci on human blood fibrin; Dr. T. H. Belt—Amoebic dysentery in Canada (report of a case); Pulmonary embolism; Thrombosis and pulmonary embolism.

DEPARTMENT OF PATHOLOGICAL CHEMISTRY
(Under the direction of Professor V. J. Harding)*

The teaching work of the fourth and fifth years has proceeded with only slight changes. The fourth year laboratory notes were revised and the general pathological notes placed in a separate section. This will facilitate reference during fifth year work. The head of the department owes his thanks to Professor Nicholson, Dr. Urquhart and Dr. Selby, who took over the fifth year lectures during his absence.

The greater part of the research work of the department has been concerned with the development and application of the biological system of sugar analysis devised by Harding and Nicholson. Professor T. F. Nicholson himself, besides taking part in some of the work bearing on the application, has studied a further number of yeasts and bacteria, hoping to find one capable of replacing *Proteus vulgaris* as a specific reagent for glucose. This latter has not failed in its specificity but is mechanically much more difficult to operate. The reagent for maltose (*Monilia tropicalis*) seems to have altered in its specificity during two years laboratory growth, and requires revision.

Progress has been made with the study of the sugar material of normal urine. Mr. R. M. Archibald and Mr. S. H. Jackson have been associated with this work. The technique in this research has been very difficult, and credit is due to both workers for some very painstaking work. The new finding has been the occurrence of galactose, both free and combined, in all urines. Large amounts of glucose can be set free by hydrolysis.

Xylose has sprung into prominence in the last two or three years as a possible reagent for the estimation of glomerular filtrate. Dr. D. L. Selby and Dr. A. K. Moffat have made an extensive study of its action on the normal kidney. The new methods of sugar analysis allow of its easy estimation under clinical conditions.

*Professor Harding died on July 5th, 1934.

Dr. R. J. Manning, Professor of Biochemistry, University of Saskatchewan, has been spending a sabbatical year with us. He has been studying intermediate hydrolysis products of glycogen and starch, by the new analytical methods.

Dr. R. W. I. Urquhart and Dr. J. L. McCollum (Fellow in Genito-Urinary Surgery) have been collaborating in an extensive study of kidney function tests in this field of surgery. The results have been of practical value and will be published shortly.

THE DEPARTMENT OF PHARMACOLOGY

(Under the direction of Professor V. E. Henderson)

The Department has been extremely fortunate in having this year the same staff as during the past two years. This has meant increased teaching efficiency as well as enabling the more continuous prosecution of research.

A change was made in the teaching of prescription writing and pharmacy this year, and on the whole the Department is pleased with the results. The change consisted in increasing the amount of experimental work in pharmacy and dispensing done in the laboratory, and in no longer sending the students to the hospital dispensaries. If this work were followed up adequately in the Department of Therapeutics, the student on graduation would be equipped to prescribe intelligently pharmacopoeial preparations.

The following pieces of research have been in progress during the year. Dr. Roepke and myself have studied the reactions of the parasympathetic nervous system to drugs and nerve stimulation, and as a result papers on the following subjects have been published during the year or are in press—On the Salivary Secretion and Blood Flow, The Mechanism of Erection, and The Mechanisms of the Urinary Bladder. The last paper strongly suggests that there is a local hormone other than acetylcholine which mediates the transference of certain parasympathetic nervous impulses. Evidence has also been obtained which points to acetylcholine being the mediating substance between pre- and post-ganglionic para-

sympathetic nervous impulses. These papers, with others by other research workers, require a recasting of a great part of our previous pharmacological teaching.

Professor Lucas has carried further his study of the ciliary activity begun last year and published this year, and has studied particularly the stickiness of the mucus secreted by bronchi and the salivary glands. The study has been a tedious one but is yielding results which have definite practical application in anaesthesia and in the treatment of cough. In conjunction with myself a series of notes on the Canadian Formulary and British Pharmacopoeia have been published in the Canadian Medical Journal.

Dr. Roepke has undertaken a study of the oxidation reduction potentials of certain of the less common sugars. This work is of fundamental importance, though its immediate application is not clear. He has also been engaged in another study of acetylcholine mechanisms which appears very interesting.

Mr. Welch has completed a study of the mode in which adrenaline is protected from prompt destruction by oxidation in the body. His findings are not only of fundamental importance but explain one of the mysteries which have long been bothering thinking pharmacologists. As a direct result he and Dr. Heard, working under the Banting Research Foundation in Biochemistry, have been able to explain certain observations previously made in regard to the production of adrenaline, and this work when completed will also prove to be of basic importance. Mr. Welch has also made a study of certain rare alkaloids isolated at the National Research Laboratories in Ottawa, which prove to form an interesting pharmacological group.

DEPARTMENT OF PHYSIOLOGY, INCLUDING GENERAL PHYSIOLOGY

(Under the direction of Professor C. H. Best)

Very few changes have been made in the teaching of this subject during the past year. A new elementary lecture

course, sixty hours, for students in Arts, has been given by Dr. E. T. Waters. Arrangements have been made to provide more demonstrations for the medical students.

The University of Toronto Physiological Society had a successful year and the meetings were well attended. The first joint meeting in Toronto of the Montreal Physiological Society with the Toronto Physiological and Biochemical Societies, was held on May 14th. Members of the Montreal group presented a very interesting programme, and plans were laid for future meetings. It is hoped that research workers at McGill and Toronto, joined at an early date by those in other Canadian Universities, will be enabled to form a society to encourage the work of students interested in physiology and biochemistry in Canada.

The work on the significance of choline in fat metabolism has progressed rapidly, and certain of the more chemical aspects of the investigation have been facilitated by the visit of Professor Harold J. Channon of the Department of Biochemistry, University of Liverpool. Evidence has been secured by Miss Huntsman and Dr. Best that choline exerts curative as well as prophylactic effects upon the livers of rats made fatty by dietetic means. Evidence is accumulating that choline is an essential dietary constituent. The work in this department on this subject has been closely correlated with the researches of Dr. MacLean and Miss Ridout in the School of Hygiene.

Mr. J. P. Fletcher has made many analyses of the choline content of various food materials and will complete his survey of choline distribution in the body.

The colony of diabetic dogs which has been maintained and studied in this department since 1921, continues to make possible contributions in the field of carbohydrate metabolism.

Dr. J. Markowitz has facilitated several investigations during the year by the application of his experience and skill in experimental surgery to problems under investigation in the department. Dr. Waters and Dr. Markowitz have investigated the relation of the liver to phosphate metabolism.

Miss Griffiths and Dr. Waters have studied the formation of liver glycogen from various monosaccharides.

Dr. Rhoda Grant is studying the formation of glycogen from lactic acid and the possible significance of acetyl choline in this connection. She has been the recipient of a grant from the Banting Foundation.

Professor N. B. Taylor and Dr. C. B. Weld completed the first stage of their investigations upon intestinal obstruction early in the academic year. The results of these researches, which were conducted in collaboration with Dr. G. K. Harrison, were published in September. During this session other phases of the problem are being investigated. So far, a study has been made of the reactions to obstruction and distension of an exteriorized, skin-covered loop of duodenum. Mr. J. F. Sykes and Dr. C. Aberhart have collaborated in these investigations. Work upon calcium metabolism and parathyroid function is being pursued. A circumscribed research concerning the action of irradiated ergosterol upon the absorption and excretion of calcium compounds was completed, as has also been one upon the relation of vitamin D action to parathyroid function. The results of the former research have been published this year; a paper embodying the latter has been submitted for publication. Interesting results have been obtained regarding the action of ergotoxin upon convulsions produced in various ways, *e.g.*, parathyroidectomy and phosphate injections. Dr. Weld this year, as in previous years, has divided his time between this department and the Hospital for Sick Children. Through this connection experimental studies upon calcium metabolism made in this department have been correlated with investigations of cognate problems in the clinic.

Dr. Fidler's work of the past year has been confined largely to attempts to define certain phenomena in air analysis. The irregularities appear to be related to oxygen.

The section of General Physiology, under Professor Laurence Irving, has had a very interesting year. The practical course was attended by thirty-eight students. Six were graduates, four were from the Physiology and Bio-

chemistry course, two were from Food Chemistry, and twenty-six were from the Biological and Medical Sciences course. Mr. K. C. Fisher's assistance has been very valuable in the preparation of experimental material. After comparison with similar courses elsewhere, the one available here seems to present an exceptionally good approach to vital problems by physiological methods. The importance of maintaining the physiological point of view is emphasized, for it is far too common in this subject to accentuate the chemical and physical definition of living processes to the point where their vitality disappears.

The methods of general physiology apply to both mammalian and "comparative" material. Consequently they should prove useful in the development of all branches of physiological and biological knowledge. While it is gratifying to have the interest of students from other departments, it also places a strain upon the staff and resources of the Department of Physiology. It is desirable that more adequate provision for the work in general physiology or experimental biology, as it may equally well be called, be made. The subject has demonstrated its usefulness in the preparation of students for work in other branches of the biological sciences and in productive research.

Professor Irving has carried on research in the following subjects: (1) With Miss J. F. Manery on the chemical changes in trout eggs during development. The eggs were donated by Mr. L. C. A. Strother of Horning's Mills, Ontario, and the Ontario Department of Fisheries. The eggs are very satisfactory material on account of the fact that the development of the embryo proceeds from two months on the isolated store of food in the original egg. (2) The respiration of the embryonic fish heart has been studied with Mr. K. C. Fisher. (a) In line with the known sensitivity of the heart toward asphyxia, its rate of beating is depressed by the respiratory poisons CO, CN and by O₂ lack. The chemical action of CO can be very precisely studied and its effect upon the heart shows the essential operation of the catalytic system in oxidations for the maintenance of the heart beat. (b) Studies

on the effect of temperature upon the heart beat have been continued. (3) The control of the circulation to the dog's brain has been studied with Mrs. M. S. Welch. It is possible for the circulation to the brain to increase while the muscular circulation diminishes. In case of asphyxia, this preferential treatment would have considerable protective value in conserving the available oxygen from the brain, which is the most sensitive and vital tissue. The stimuli involved in this preferential control of the blood supply to the brain have been considered, and the nervous pathways are being studied. (4) The respiration of liver with normal and disturbed fat metabolism has been studied by Mrs. Welch. The material was made available from the experiments of Dr. Best and Miss Huntsman, and it is likely that it will afford a unique opportunity to penetrate into the subject of fat metabolism in the liver tissue by highly developed methods for the study of tissue respiration. (5) The lactic acid forming capacity of muscle from various animals has been examined, continuing a line of investigation in progress for several years. (6) The postmortal acid formation of liver was examined by determining the lactic acid and CO_2 contents. There are indications that other acids than lactic acid are formed but their nature is undetermined.

Last summer five graduates from the department attended the Marine Biological Laboratory at Woods Hole for research in Physiology. They derived great profit from the study of new material and association with a cosmopolitan group of investigators and students. In addition they made an excellent showing, for Mr. A. L. Chute was appointed a junior instructor for 1934, and the Collecting Net Fellowship for 1934 was awarded to Mr. O. M. Solandt. Several members of the staff will attend again this summer for the continuance of research work. This work has been greatly aided by individual grants from the Medical Research Best Fund. An investigation of the adaptation of seals for diving is planned for this summer. The work is aided by a grant from the Elizabeth Thompson Science Fund of Cambridge, Massachusetts, and the continued aid of the Medical Research Best

Fund. The work is to be carried on at the Atlantic Biological Station of the Biological Board of Canada, at St. Andrews, New Brunswick. The peculiar ability of diving mammals to survive without breathing for long periods has never been investigated satisfactorily. Methods have been carefully developed for the investigation to such a point that it is certain that significant results will be obtained. The methods are also along lines which will probably yield important information regarding the control of respiration and circulation generally; for the control, which is extremely complex in ordinary mammals, should appear in an emphatic fashion in the seals with their highly developed ability to resist asphyxia.

DEPARTMENT OF PSYCHIATRY

(Under the direction of Professor C. B. Farrar)

There has been no change in curricular instruction for medical students during the past year. Owing to large classes and restricted time we continue to stress particularly the value of the Fifth Year elective work in psychiatry. Nineteen students were enrolled in this course. Three of these have been awarded student internships for the coming year at the Toronto Psychiatric Hospital. Each year after graduation several of these students enter some branch of psychiatric work.

Training interests are necessarily concentrated on small groups. These include in addition to the elective undergraduate students the post-graduate physicians in residence, the work being predominatingly practical and clinical. During the year these interests have been somewhat extended to include other medical branches with the result that it is possible to present psychiatric problems in their relationship to the fields of general medicine, surgery and neuro-surgery, gynaecology and obstetrics, pediatrics, ophthalmology and oto-laryngology.

In the Out-Patient Department intensive work is being done in the behaviour disorders of childhood. A special

study of modifiability of schizoid trends in early life is in progress and some encouraging results have been observed. Both the graduate and elective students participate in this work including field activities.

Beside instruction of medical groups there has been further expansion of training in other fields particularly nursing. A course of twelve lectures was given for the first time in the one-year course of public health nursing. From time to time one or more lectures have been given by various members of the staff as requested by social or educational bodies.

In the students' consultation service in mental hygiene, approximately a dozen students from various faculties were seen during the year. In no case was there any untoward development.

Staff change: In January, 1934, Dr. A. J. Kilgour, fellow in psychiatry, was awarded the Rockefeller fellowship for two years in psychiatry in England and on the continent. He was granted leave of absence for this period. Dr. C. G. Stogdill was promoted from the position of assistant to that of demonstrator. Dr. C. H. McCuaig was appointed fellow and assumed the duties hitherto carried by Dr. Kilgour.

DEPARTMENT OF RADIOLOGY

(Under the direction of Associate Professor G. E. Richards)

We have to record the loss early in the Academic Year of Dr. W. H. Dickson, whose death on October 28th, 1933, was a severe blow to the Radiological service. In a suitable resolution of the Faculty his great contribution to radiology was fittingly acknowledged. No other staff changes took place during the year.

Dr. A. C. Singleton was promoted to the rank of senior demonstrator and has carried on the teaching duties formerly performed by Dr. Dickson.

In November 1933, the new Radiological Department at the Toronto General Hospital was occupied and on April 4th, the Institute of Radio-Therapy was formally opened. These

two associated services now bring to completion a programme of organization which has been under way for several years.

Three floors of the former Pathological Building are occupied. On the first floor, provision has been very adequately made for the general radiological service of the public wards and out-patient departments of the hospital. Two fracture rooms for the emergency and fracture services and a very complete unit for the Urological service. The latter includes four combined radiographic-cystoscopic rooms, of which three have been presently equipped and are in daily use, the fourth being held in reserve. This unit also includes consulting and examining rooms for the staff, clinical laboratory facilities, etc.

On the next floor, provision has been made for certain types of radiographic work but the floor is mainly devoted to the requirements of the Institute of Radio-therapy. Here are located the radium application rooms, examining, consulting, history and record rooms, etc. Three rooms are provided for administering high-voltage X-ray therapy and one for moderate voltage and superficial X-ray therapy.

The Department now has in use just under six grammes of radium of which approximately one and a half grammes is the property of the General Hospital and the balance has been provided by the Government of the Province of Ontario. Of this quantity four grammes is contained in a so-called radium "bomb" and is being used in certain types of cases for treatment by "mass-radiation" externally. The container used was manufactured for the Institute in Sweden and the method being followed in treatment follows closely the Swedish practice.

The next floor is equipped for the bed accommodation of fifty patients carrying into effect the agreement with the Provincial Government. These wards are particularly bright and cheerful and are admirably suited to the requirements of an Institute of this sort.

The entire department thus provides the University of Toronto with radiological facilities of an unusual character. Several Universities possess individual departments in which

either X-ray diagnosis or X-ray or radium therapy are well organized but few possess a department which contains within itself such complete facilities in all branches of radiology.

DEPARTMENT OF SURGERY

(Under the direction of Professor W. E. Gallie)

The year 1933-34 has been marked by satisfactory results in teaching and in a large increase in the amount of surgery done. The only serious drawback to the success of the department is the large size of the classes which makes it impossible for the student to get individual instruction and to have sufficient opportunity to come in contact with patients. There is a limit to the amount of handling by students that sick people can stand and that limit has long since been reached.

The establishment of the Ontario Institute of Radiotherapy has been completed during this year and a satisfactory arrangement made with the department of Surgery in regard to its staff. The surgical representatives are the Head of the department as consultant and Drs. R. I. Harris, R. M. Janes, R. Pearse, H. W. Wookey and K. Welsh as the active staff. Associated with the director of the Institute, these gentlemen are in charge of special groups of cases: Dr. Harris, the bones; Dr. Janes, the breast; Drs. Wookey and Welsh, the mouth and pharynx, and Pearse, the bladder, prostate and kidney. By this arrangement it is expected that the great opportunity afforded by the Institute will be made use of and expertness in the diagnosis and treatment of these diseases will be developed. This combination of the department of Radiology with the department of Surgery indicates the effort that is being made to pool resources in the battle against malignant disease.

The new Urological department at the General Hospital, under the direction of Dr. R. Pearse, is now in operation and is proving most satisfactory. The fifty beds are nearly always full and the outpatient service has increased enor-

mously. This plant and equipment are now the equal of any and the result of the changes has been a great improvement in the service and in the teaching. With the establishment of the new department we have arranged a scheme by which each final year student gets ten days intensive practical training on the wards and in the outpatient department.

Two changes have been made this year designed to make the training of final year students more practical. The first of these provides that each student will have twenty days service attached to the Emergency department. During this period he attends all cases seen in that department and the training is most valuable. The second consists of a course of practical exercises in the treatment of fractures. Cadavers in which various fractures have been produced are used and the students go through the motions of manipulating and reducing these fractures, with the assistance of the new fluoroscope which was placed in the Banting Institute by the General Hospital and Doctor Richards. The students receive practical training in treatment, also.

It has been the policy of the department of Surgery to combine whenever possible in research work with other University departments. This has been done with Physiology in the work of Dr. W. G. Murray in the study of the effect of heparin in preventing thrombosis. Venous thrombosis and pulmonary embolism are serious dangers after operation and the research which is under the direction of Professor Best is directed towards finding a way to prevent it. Some progress has already been made.

Another study is being conducted by Dr. H. Botterell of the Department of Surgery and Dr. E. J. King of the Department of Experimental Medicine, under the direction of Dr. Banting, on the effect of phosphatase on the healing of fractures. This research is directed towards finding ways of increasing the rapidity of union of fractures.

During this year, with the assistance of Professor Klotz, a private pathological laboratory has been established by the Department of Surgery in the Banting Institute. This laboratory provides the opportunity for any member of the

department to pursue studies of pathological material and to have specimens prepared. The laboratory is equipped with photographic and microphotographic apparatus so that the department no longer needs to depend on other departments for assistance in this regard. Dr. S. D. Gordon is using the laboratory in a study of gastric and duodenal ulcer and Dr. D. W. Mitchell in a study of the pathology of the prostate gland.

Other researches in progress are:

1. Clinical applications of staphylococcus antitoxin and staphylococcus toxoid; and attempts at the production of pyogenic brain abscesses—Dr. W. S. Keith.
2. Attempts at the production of tendon sheathes—Dr. A. W. Farmer.
3. Thrombosis of axillary veins and interference with surrounding lymphatics. Attempts to produce epidermoid cysts in bone by implants—Dr. J. H. Couch.
4. A clinical study is being made in the General Hospital by Dr. W. K. Welsh and Dr. Dolman of the effect of the staphylococcus toxoid and staphylococcus antitoxin which is being prepared in the Connaught Laboratories. Promising results, particularly in the case of the toxoid have been observed.

The follow-up clinics which were established a year ago are working very successfully and are proving to be a stimulus in the study of the special diseases for which they were established. The gastro-intestinal clinic has been particularly interesting and has already provided material for two important papers. We shall gradually increase these clinics until all the members of the staff are engaged in some clinical study.

This year the department is losing Dr. Clutterbuck and Dr. Hair who have served faithfully and well for many years. Dr. Clutterbuck is retiring because his term of service on the active staff of the Western Hospital is completed and Dr. Hair, in order that he may devote more time to other work. The Department regrets exceedingly that the term of their service is over.

The Department of Surgery lost two of its former members during this year in the deaths of Professor Emeritus Irving H. Cameron and Professor Emeritus F. N. G. Starr. Mr. Cameron gave distinguished service as Professor of Surgery for thirty-three years and conducted the Department as its Head for many years prior to his retirement in 1920. He "was an able surgeon, a stimulating teacher and a loyal friend; he will ever be remembered by his patients and students and associates with gratitude and affection". Dr. F. N. G. Starr joined the Department in 1891, becoming Associate Professor in 1900, Professor of Clinical Surgery in 1923, and on his retirement in 1933, Professor Emeritus. His valuable and faithful service during this long period was very greatly appreciated and his sudden death was a severe shock to those with whom he had been so closely associated in the teaching of Surgery.

DEPARTMENT OF THERAPEUTICS

(Under the direction of Professor R. D. Rudolf)

The work on the whole has been very satisfactory and all of my staff have performed their duties to my satisfaction.

There was the usual difficulty about getting the required six anaesthetics for each student but this was overcome before the final examination took place.

The work from now on will be under the direction of a new head, Dr. R. F. Farquharson, and no better choice could have been made. I am extremely glad to know that the Department is to be continued as a separate one, although, of course, it must keep in the closest touch with those of pharmacology and medicine.

ART SERVICE

(Under the direction of Miss M. T. Wishart)

The work of the Art Service during the past year has gone steadily forward. The extent of its usefulness to the Faculty

of Medicine is evidenced by the ever-widening field from which requests come. This year has seen for the first time the application of the wax moulage technique to illustrate surgical procedure, as for Dr. W. E. Gallie's paper on Tendon Fixation. On the whole the work carried on has been a furtherance of some of the more important subjects begun last year.

Summary of Work of Art Service

1. According to medium of work:	
1. Water-colour.....	20
2. Half-tone.....	17
3. Pen and ink.....	36
4. Wax moulage.....	10
5. Plaster models.....	3
6. Lettering.....	12
7. Sketches.....	6
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Total.....	104
2. According to departments:	
1. Anatomy.....	2
2. Hygiene.....	2
3. Medicine.....	4
4. Oto-laryngology.....	7
5. Paediatrics.....	7
6. Pathology.....	3
7. Physiology.....	10
8. Surgery.....	69
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Total.....	104
3. Number of members of faculty for whom work was done	
	25

REPORT OF THE MEDICAL SOCIETY

President.....	R. C. Dickson
Vice-President.....	R. G. Clark
Secretary-Treasurer.....	F. J. McInnis
Assistant Secretary-Treasurer.....	J. L. Cathie

The medical undergraduates of the University of Toronto have brought their activities to a close for the present year.

Under the leadership of Bob Dickson, President of the Society, and his hard-working committee, we feel that this year has been as successful as any in the past.

The premier social event in Toronto, the "Annual Medical At-Home", was held in the Royal York on January 26th. Roy Clark, the Chairman, and his committee, worked extremely hard to make it not only a social but a financial success. The dance was conducted in the form of a "Social Clinic" to treat ailing students with that dread malaise known as "Duck's Disease", the etiology of this disease is attributed to overwork in the medical course.

The famous "Daffydil" was held in Hart House Theatre in February. The tragic dramas and the sublime comedies enacted there were "the talk of the town" for weeks. The committee in charge of this performance was headed by "Tap" Cranfield. The Fifth Year won the coveted cup for their excellent work. The efforts put forward by all those participating in the show, were rewarded by their presence at a banquet in the King Edward Hotel, held in their honour.

Colley Foster, Editor of the Undergraduate Medical Journal, and the Editorial Staff, are to be congratulated on the superb articles contributed this year. Many members of the Staff and of the undergraduate body presented extremely interesting papers.

The Undergraduates were fortunate in having Dean FitzGerald and the Lieutenant-Governor, the Honorable Doctor H. A. Bruce address them at open meetings. We feel proud to think that these great men still take an interest in our activities. "Len" Williams who was in charge of these meetings is to be congratulated.

The year has not been without its sadness. It has been marked by the death of many prominent members of the Staff and of the Student Body. We bow in sorrow, but with true "Esprit de Corps" we shall try to carry on the noble traditions of the profession of medicine.

MEDICAL ATHLETIC ASSOCIATION

President.....J. D. McLennan
Vice-President.....S. F. Robertson
Secretary-Treasurer.....H. S. Doyle

The Medical Athletic Association came into office with the resolution that medical teams and athletics would have every encouragement. This we feel we have carried out. Medical teams took the field well equipped and outfitted.

Although the Association feels that it should be particularly interested in the students taking part in interfaculty sport, yet it should be noted that we are possibly better represented in intercollegiate sport than any other faculty. In Rugby, for example, on the university first and second teams about half the regular players this year were medical students. In addition, the Athletic Directorate for 1934-35 will be composed of four medical students and one other member. Thus, medicine is well represented on the university athletic honour roll.

We entered a junior and a senior team in the following interfaculty sports: Rugby, Basket-ball, Hockey and Water Polo. One team was entered in Soccer, Track, Lacrosse, Boxing, Wrestling, Fencing, Gymnastics, Rowing, Harrier, Volley Ball and Baseball.

The Gymnastic team was this year the only team to win championship honours. Nearly all the other teams were well to the fore in their respective competitions. The Basketball, Lacrosse and Junior Rugby teams were very close to the winners.

This year we granted thirty-six "M's" or medical letters. We are pleased to say that although some of these went to individual outstanding athletes, most of them were awarded to undergraduates for their efforts on various teams for a period of not less than three seasons.

The medical women who took part in athletics this year supported their teams very faithfully and put up a good fight in interfaculty sports. A few optimists organized a baseball team, which was composed chiefly of girls from the School

of Science. One Dental student also joined our ranks. Three "M's" were awarded and there are two "T" holders, one the gold medallist of the final year.

MEDICAL WOMEN'S UNDERGRADUATE ASSOCIATION

Honorary President.....	Dr. Marion Hilliard
President.....	Jessie Gray
Vice-President.....	Bliss MacQuarrie
Secretary.....	Margaret Harcourt
Treasurer.....	Dorothy Whinton

A most successful and happy year has just been completed under the able leadership of Jessie Gray.

The many social activities, including the time honoured institutions of Initiation, and a Farewell party for the Seniors, were enthusiastically attended, and their intimate nature deepened many a friendship and helped to bind juniors and seniors together, while at the Annual "At-Home", held this year at the University Women's Club, once more the staff, graduates and undergraduates mingled on the most friendly terms and enjoyed a very pleasant afternoon.

Enthusiasm was also shown in dramatics, and the women's skit in Daffydil was said to be the best in the past few years.

But the medical women were not satisfied to spend their energy on social activities and dramatics, the "women's instinct" for pleasant surroundings came to the fore, and many yearned for a brighter and more comfortable common room. Subsequently, through the untiring efforts of some of the members, and the co-operation of our Dean, the common room was redecorated, and the result is most gratifying.

The recognition of women in our profession was not easily won by our predecessors, and we, the medical women of to-day, appreciate what they did for us and by being alert and co-operative, determine to hold fast the heritage gained for us.